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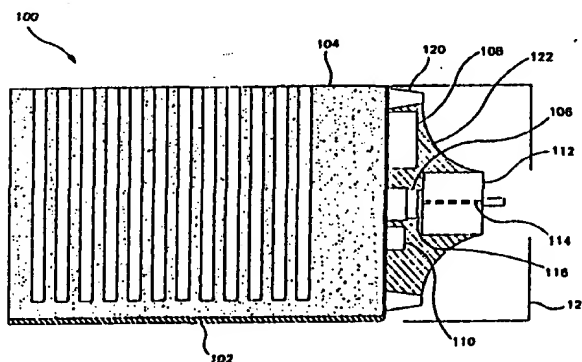
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Ave. of the Americas, New York, NY 10036 (US).(81) Designated States (*national*): AL, AG, AI, AM, AT, AU,  
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NI, SN, TD, TG).

[Continued on next page]

(54) Title: OPTICAL POWER CONTROL SYSTEM



(57) Abstract: An optical power control system is provided that may be used in connection with an optical transmitter, receiver or transceiver module. The optical power control system comprises: (1) an array of optoelectronic devices; (2) an array of optical elements; (3) the array of optical elements optically aligned to the array of optoelectronic devices in such a manner that one or more optical elements is optically aligned to one or more optoelectronic devices; (4) a light receiving device; and (5) a reflector proximate to the array of optical elements, the reflector optically orientated with the array of optoelectronic devices and the light-receiving device such that some emission from at least one optoelectronic device is reflected on at least a portion of the light-receiving device. The optical elements may be optical fibers and may be packaged in a ferrule. The light-receiving device may be a photo-detector or a light pipe. A feedback loop connects the light-receiving device to the array of optoelectronic devices so as to adjust the output of the array of optoelectronic devices in response to the emission detected by the light-receiving device. The reflector scatters the emission from the optoelectronic device, and it may be adapted to a bottom surface of a ferrule. In another embodiment, optical resin is dispensed proximate to the array of optoelectronic devices and light-receiving device. Emission from at least one optoelectronic device is reflected onto the light-receiving device by the optical resin.

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**Previous Correction:**

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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/43264

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 G02B6/42

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 G02B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 97 25641 A (KROPP JOERG REINHARDT ;SIEMENS AG (DE)) 17 July 1997 (1997-07-17) page 9, line 7 -page 10, line 15; figure 2	1-4,6-9, 11-19,21
Y		5,10, 51-61
X	WO 97 25638 A (KROPP JOERG REINHARDT ;STANGE HERWIG (DE); SIEMENS AG (DE)) 17 July 1997 (1997-07-17) page 12, line 28 -page 16, line 18; figures 1-6	1-9, 11-15, 19,21
Y		10,51-61
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
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- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

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\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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FURTHER INFORMATION CONTINUED FROM PCT/SA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-21, 51-61

subject 1 relates to a laser array/optical element holder arrangement with a monitor diode for detecting the laser array output and a with a reflector incorporated into the optical element holder for directing (part) of the laser emission to the monitor diode

2. Claims: 22-50

subject 2 relates to a reflector for coupling the output of a monitor laser diode in a laser array arrangement to a receiving monitor diode

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/43264

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 790 678 A (ALSTHOM CGE ALCATEL) 20 August 1997 (1997-08-20)  column 1, line 49 -column 3, line 2; figures 1,2	1,2,8,9, 11-15, 19,21
X	EP 0 974 856 A (HONEYWELL INC) 26 January 2000 (2000-01-26)  column 11, line 32 -column 13, line 12; figures 9,10	1,2,8,9, 11-15, 20,21
X	WO 00 13051 A (DIGITAL OPTICS CORP ;FELDMAN MICHAEL R (US); JOHNSON ERIC G (US);) 9 March 2000 (2000-03-09) page 5, line 3 -page 6, line 4 page 11, line 15 -page 12, line 10; figure 6	1,2,7-9, 11-15,21
Y		51-61
Y	PATENT ABSTRACTS OF JAPAN vol. 1998, no. 10, 31 August 1998 (1998-08-31) -& JP 10 126002 A (MATSUSHITA ELECTRON CORP), 15 May 1998 (1998-05-15) abstract; figures 5,6,10	5,10, 51-61
A	EP 0 899 592 A (BOSCH GMBH ROBERT) 3 March 1999 (1999-03-03) column 2, line 54 -column 3, line 58	6
Y	US 5 226 052 A (NAKATA NAOTARO ET AL) 6 July 1993 (1993-07-06) column 1, line 50 -column 2, line 32 column 3, line 1 -column 4, line 62	22-50
Y	EP 0 607 700 A (SHARP KK) 27 July 1994 (1994-07-27) column 1, line 18 -column 2, line 29 column 18, line 12 - line 51; figures 13,43,44	22-50
A	US 5 907 571 A (KOMATSU KEN ET AL) 25 May 1999 (1999-05-25) column 6, line 59 -column 7, line 41; figures 7,8	22-50

# INTERNATIONAL SEARCH REPORT

international application No.  
PCT/US 01/43264

## Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
  
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/43264

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9725641	A	17-07-1997	DE 19601955 A1 WO 9725641 A2 WO 9725638 A2 EP 0873534 A2 JP 2000502819 T US 5997185 A	10-07-1997 17-07-1997 17-07-1997 28-10-1998 07-03-2000 07-12-1999
WO 9725638	A	17-07-1997	DE 19601955 A1 DE 19650853 A1 WO 9725641 A2 WO 9725638 A2 EP 0873534 A2 JP 2000502819 T US 5997185 A	10-07-1997 10-07-1997 17-07-1997 17-07-1997 28-10-1998 07-03-2000 07-12-1999
EP 0790678	A	20-08-1997	DE 19605726 A1 EP 0790678 A2 JP 9312407 A	21-08-1997 20-08-1997 02-12-1997
EP 0974856	A	26-01-2000	US 6081638 A EP 0974856 A2	27-06-2000 26-01-2000
WO 0013051	A	09-03-2000	AU 5789999 A CA 2306845 A1 EP 1047970 A1 JP 2002523910 T WO 0013051 A1 US 2002150341 A1 US 6314223 B1 US 6452669 B1 US 6404959 B1	21-03-2000 09-03-2000 02-11-2000 30-07-2002 09-03-2000 17-10-2002 06-11-2001 17-09-2002 11-06-2002
JP 10126002	A	15-05-1998	NONE	
EP 0899592	A	03-03-1999	EP 0899592 A1	03-03-1999
US 5226052	A	06-07-1993	JP 2547465 B2 JP 4014888 A JP 2547466 B2 JP 4023381 A	23-10-1996 20-01-1992 23-10-1996 27-01-1992
EP 0607700	A	27-07-1994	JP 3074092 B2 JP 6314847 A JP 3084173 B2 JP 6334269 A JP 3022059 B2 JP 6350131 A JP 6196817 A CA 2112343 A1 CN 1093837 A ,B DE 69326136 D1 DE 69326136 T2 EP 0607700 A2 US 5557116 A	07-08-2000 08-11-1994 04-09-2000 02-12-1994 15-03-2000 22-12-1994 15-07-1994 25-06-1994 19-10-1994 30-09-1999 24-02-2000 27-07-1994 17-09-1996
US 5907571	A	25-05-1999	JP 3153149 B2 JP 10056238 A	03-04-2001 24-02-1998